EXHIBIT C

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY	REC'D 0 8 FEB 2006 WIPO PCT **PCT**

To: see form PCT/ISA/220	**WRITTEN OPINION OF THE** **INTERNATIONAL SEARCHING AUTHORITY** (PCT Rule 43*bis*.1)

	Date of mailing *(day/month/year)* see form PCT/ISA/210 (second sheet)
Applicant's or agent's file reference see form PCT/ISA/220	**FOR FURTHER ACTION** See paragraph 2 below

International application No. PCT/US2005/036815	International filing date *(day/month/year)* 14.10.2005	Priority date *(day/month/year)* 15.10.2004

International Patent Classification (IPC) or both national classification and IPC H04L1/08, H04L27/26, H04L1/00

Applicant AWARE, INC.

1. This opinion contains indications relating to the following items:

☒ Box No. I   Basis of the opinion

☐ Box No. II   Priority

☐ Box No. III   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

☐ Box No. IV   Lack of unity of invention

☒ Box No. V   Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

☐ Box No. VI   Certain documents cited

☒ Box No. VII   Certain defects in the international application

☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Papantoniou, A Telephone No. +31 70 340-4116

Form (PCT/ISA/237) (Cover Sheet) (January 2004)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
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Box No. I   Basis of the opinion

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐   This opinion has been established on the basis of a translation from the original language into the following
      language   , which is the language of a translation furnished for the purposes of international search
      (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

      ☐   a sequence listing

      ☐   table(s) related to the sequence listing

   b. format of material:

      ☐   in written format

      ☐   in computer readable form

   c. time of filing/furnishing:

      ☐   contained in the international application as filed.

      ☐   filed together with the international application in computer readable form.

      ☐   furnished subsequently to this Authority for the purposes of search.

3. ☐   In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY	International application No. PCT/US2005/036815

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	3-5, 28-30
	No:	Claims	1, 2, 6-27, 31-43

Inventive step (IS)	Yes:	Claims	3-5, 28-30
	No:	Claims	1, 2, 6-27, 31-43

Industrial applicability (IA)	Yes:	Claims	1-43
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Form PCT/ISA/237 (January 2004)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

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Re Item V.

1. The following document (D1) is referred to hereby:

D1: US-B1-6 243 414 (DRUCKER VITALY ET AL) 5 June 2001 (2001-06-05)

1. The present application does not meet the requirements of Article 33 PCT, because the subject matter of claims 1, 2, 6-27, 31-43 is not new in the sense of Article 33(2).

1.1 Claim 1: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising
determining a number of DMT symbols to be repeated during initialisation based on an impulse noise protection value (column 4, lines 44-56; column 5, line 41 - column 6, line 7; column 7, lines 18-34; Fig.2).

1.2 Claim 13: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising
utilising an impulse noise protection value to determine a DMT repeat value, the repeat value specifying the number of DMT symbols to be repeated during initialisation (column 4, lines 44-56; column 5, line 41 - column 6, line 7; column 7, lines 18-34; Fig.2).

1.3 Claim 14: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising
repeating a DMT symbol a number of times during initialisation message transmission (column 4, lines 44-56; column 5, line 41 - column 6, line 7; column 7, lines 18-34; Fig.2) utilising a cyclic redundancy checksum to validate the integrity of received initialisation messages (column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

1.4 Claim 15: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising
determining how many DMT symbols should be repeated during initialisation based on an impulse protection value (column 4, lines 44-56; column 5, line 41 - column 6, line 7; column 7, lines 18-34; Fig.2).

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1.5 Claim 16: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising
modulating at least one message bit onto a number of repeated DMT symbols and transmitting the number of repeated DMT symbols (column 4, lines 44-56; column 5, line 41 - column 6, line 7; column 7, lines 18-34; Fig.2).

1.6 Claim 17: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising modulating at least one bit onto a DMT symbol and repeating the DMT symbol a number of times in an initialisation message
(column 4, lines 44-56; column 5, line 41 - column 6, line 7; column 7, lines 18-34; Fig.2).

1.7 Claim 18: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising
determining an information to cyclic redundancy checksum ratio
(column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992); and modulating at least one or more cyclic redundancy checksums onto a DMT symbol during initialisation (column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

1.8 Claim 19: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) wherein a cyclic redundancy checksum and repeated DMT symbols are used for initialisation messages
(column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

1.9 Claim 20: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising modulating error detection information onto a DMT a symbol during initialisation (column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

1.10 Claim 21: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising modulating error detection information onto one or more DMT symbols during initialisation (column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

1.11 Claim 22: The document D1 discloses a communication system initialisation method (column 2, lines 28-31) comprising modulating error detection information onto a plurality of DMT symbols (column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992)
assembling the DMT symbols into a consecutive sequence of identical DMT symbols
(column 9, lines 3-28)
repeatedly transmitting the consecutive sequence of identical DMT symbols
(column 9, lines 3-28).

1.12 Claim 23: The document D1 discloses means for performing the functionality of claim 1 (column 2, lines 28-31).

1.13 Claim 24: The document D1 discloses an information storage media having information stored thereon that performs the functionality of claim 1 (column 2, lines 28-31).

1.14 Claim 25: The document D1 discloses a communication protocol that performs the method of claim 1 (column 2, lines 28-31).

1.15 Claim 26: The document D1 discloses a communication system
(column 2, lines 28-31) comprising
a DMT symbol to be repetition module designed to determine a number of DMT symbols to be repeated during initialisation based on an impulse noise protection value (column 4, lines 44-56; column 5, line 41 - column 6, line 7; column 7, lines 18-34; Fig.2).

1.16 Claim 38: The document D1 discloses means for protecting against impulse noise during initialisation (column 2, lines 28-31) comprising
analysing an initialisation message length
(column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992), one or more repeating DMT symbols during initialisation and modulating error detection information onto a DMT symbol during initialisation
(column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

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1.17 Claim 39: The document D1 discloses an impulse noise error mitigation system
(column 2, lines 28-31) comprising
means for determining an impulse noise mitigation technique
means for implementing the determined technique
(column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

1.18 Claim 40: The document D1 discloses a communication system
(column 2, lines 28-31) comprising
means for associating error detection information with one or more DMT symbols
transmitted during initialisation
(column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

1.19 Claim 41: The document D1 discloses a communication system
(column 2, lines 28-31) comprising
means for associating error detection information with one or more DMT symbols received
during initialisation
(column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

1.20 Claim 42: The document D1 discloses a communication system
(column 2, lines 28-31) comprising
means for analysing a number of repeated DMT symbols that are received during
initialisation and determining which one or more of the repeated DMT symbols have errors
(column 2, lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992).

1.21 Dependent Claims: Dependent claims 2, 6-12, 27, 31-37 and 43 do not appear to
contain any additional features which, in combination with the features of any claim to
which they refer, meet the requirements of the PCT with respect to novelty. Document D1
discloses the additional features of Claims 2, 6, 27, 31 (column 4, lines 44-56; column 5,
line 41 - column 6, line 7; column 7, lines 18-34; Fig.2), 7, 8, 9, 32, 33, 34, 43 (column 2,
lines 32-58; column 1, lines 15-37, same ADSL standard as application - G992), 10-12,
35-37 (column 9, lines 3-28).

2. Claims 3-5, 28-30: The subject matter of claims 3-5, 28-30 is both new and inventive
and satisfies the requirement of Article 33 PCT.

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Re Item VII

1. The requirements of Rule 5.1(a)(ii) PCT are not met since the document D1 is not identified in the description and the relevant background art disclosed therein is not briefly discussed.

3. The requirements of Rule 6.3(b) PCT are not met, since the two-part form is not used for the independent claims.

4. The requirements of Rule 6.2(b) PCT are not met, since the features of the claims are not provided with reference signs placed in parentheses.

5. The requirements of Article 6 PCT are not met, due to the presence in the description of the application on page 23, line 6 of the vague and imprecise statement "spirit of invention".

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International application No.

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Re Item VIII

1. Although claims 1, 13-22, have been drafted as separate independent <u>method</u> claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness. Moreover, lack of clarity of the claims as a whole arises, since the plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection.

Hence, claims 1, 13-22 do not meet the requirements of Article 6 PCT, since the invention is <u>not</u> disclosed by means of a <u>single</u> method claim.

The same objection also holds for the <u>system</u> Claims 26, 39-42, which do not meet the requirements of Article 6 PCT, since the invention is <u>not</u> disclosed by means of a <u>single</u> system claim. The above discussion is not repeated here for reasons of economy.

Finally, the same objection also holds for the <u>means</u> claims 23 and 38 which do not meet the requirements of Article 6 PCT, since the invention is <u>not</u> disclosed by means of a <u>single</u> means claim. The above discussion is not repeated here for reasons of economy.

2. The application does not meet the requirements of **Article 6 PCT**, because **claims 1,11, 13-26, 36, 38-42** are not clear.

2.1 Claims 1, 13-26, 38-42: The feature of **"impulse noise protection value"** is vague in that it is not clear as to what this value actually represents so that it is not apparent to the person skilled in the art how to determine the number of DMT symbols to be repeated based on this value.

The **impulse noise protection value** is also an essential feature of the invention, in accordance with the description of the application on page 2, line 18 - page 3, line 2, whereby the **impulse noise protection value** defines parametrically the problem of the invention, i.e. the effect of the impulse noise on the number of symbols that are completely corrupted by the impulse noise.

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The definition of the **impulse noise protection value** is clearly provided in the above description passage, as shown below:

"**impulse noise protection value**: the number of consecutive DMT symbols that, when completely corrupted by impulse noise, can be corrected by the receiver using FEC and interleaving during data transmission mode"

The above definition is <u>not</u> present in Claim 1 and as mentioned above, is an essential feature of the invention, which solves the problem of impulse noise corruption of DMT symbols by repeating DMT symbols as a function of the number of consecutive corrupted DMT symbols that can be corrected by the receiver using FEC and interleaving.

Since independent claim 1 does not contain these features it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

The same objection also holds for Claims 13-26, 38-42 since they also not specify that the **number of DMT symbols to be repeated is based on the number of consecutive DMT symbols that, when completely corrupted by impulse noise, can be corrected by the receiver using FEC and interleaving during data transmission mode.**

2.2 Claims 11 and 36:

The term "substantially" used in Claims 11 and 36 introduces inexactness into the quantities referred to, thereby resulting in lack of clarity of the claims (Article 6 PCT).

2.3 Claim 25: The claim category (protocol) is unclear in that it presents neither a method nor a system. A protocol is merely a convention which is used by different parties so that to apply common practices and does not present a category of claim that may provide protection as it can not be described in terms of system means or method steps.

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